

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in view of the present amendments and in light of the following discussion, is respectfully requested.

Claims 22-31 and 35-42 are pending. Claims 22 and 37-42 are amended, and Claims 32-34 are canceled without prejudice or disclaimer. No new matter is introduced.¹

In the outstanding Office Action, Claims 37-42 were rejected under 35 U.S.C. § 101; Claims 22-34 were rejected under 35 U.S.C. § 102(b) as being anticipated by Sugawara² (WO 2003/056622, hereafter “Sugawara”); Claims 22-25 were rejected under 35 U.S.C. § 102(b) as being anticipated by Takagi (U.S. Patent No. 6,174,796, hereafter “Takagi”); Claims 37-41 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takagi; and Claims 35-36 and 42 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takagi in view of Waldfried (U.S. Patent No. 6,630,406, hereafter “Waldfried”).

In reply, amended Claims 37-42 are amended to recited “a computer-readable medium” in conformity with the requirements of 35 U.S.C. § 101. Accordingly, it is respectfully requested that the rejection of amended Claims 37-42 under 35 U.S.C. § 101 be withdrawn.

With regard to the rejection of Claims 22-34 as being anticipated by Sugawara, amended Claim 22 recites:

A method for cleaning a surface of a conductive layer on a semiconductor substrate placed in a reaction chamber, wherein plasma containing *hydrogen, helium and argon* is generated in the reaction chamber, and the surface of the conductive layer is cleaned by being reduced therewith.

Turing to the applied reference, Sugawara describes a method of exposing a semiconductor surface to hydrogen radicals excited by plasma that is formed by irradiation

¹ Non-limiting support for the amended claims can be found at least at paragraph 27 of the Specification, for example.

² Machine translation provided by the U.S. Patent and Trademark Office.

from a microwave plane antenna.³ Sugawara describes controlling the amount of hydrogen radicals produced by changing the process pressure while maintaining low substrate temperatures.⁴ More specifically, Sugawara describes that the hydrogen radicals are generated by applying plasma excitation to a mixed gas of hydrogen mixed with a noble gas such as Ar or Kr.⁵ However, Sugawara does not disclose the claimed plasma containing hydrogen, helium and argon. Instead, Sugawara merely combines hydrogen with a single noble gas. Therefore, Sugawara fails to disclose every element recited in amended Claim 22. Further, Sugawara fails to disclose every element recited in Claims 23-31 as these claims depend from amended Claim 22. Further, Claims 32-34 are canceled without prejudice or disclaimer. Accordingly, it is respectfully requested that the rejection of amended Claim 22 and Claims 23-31 under 35 U.S.C. § 102(b) as being anticipated by Sugawara be withdrawn.

Regarding the rejection of Claims 22-25 as being anticipated by Takagi, Takagi describes a method of manufacturing semiconductor devices containing copper wirings.⁶ Takagi describes annealing a silicon substrate at a temperature between 200°C and 400°C in an atmosphere containing 80% hydrogen and 20% argon.⁷ However, Takagi does not disclose the claimed plasma containing hydrogen, *helium* and argon. In fact, Takagi does not mention helium at all. Therefore, Takagi fails to disclose every feature recited in amended Claim 22, and amended Claim 22, together with its corresponding dependent claims, is in condition for allowance. Accordingly, it is respectfully requested that the rejection of amended Claim 22 and Claims 23-25 under 35 U.S.C. § 102(b) as being anticipated by Takagi be withdrawn.

With respect to the rejection of amended Claims 37-41 as being unpatentable over Takagi, amended Claim 37 recites a plasma containing hydrogen, helium and argon. For the

³ See the Abstract of the machine translation of Sugawara.

⁴ Sugawara at page 9, lines 31-37.

⁵ Sugawara at page 10, lines 30-37.

⁶ Takagi at column 1, lines 5-10.

⁷ Takagi at column 5, lines 15-31.

reasons discussed above, Takagi fails to disclose this feature. As such, amended Claim 37 is in condition for allowance, together with its corresponding dependent claims. Therefore, it is respectfully requested that the rejection of amended Claims 37-41 under 35 U.S.C. § 103(a) be withdrawn.

Though Claims 35-36 and amended Claim 42 were rejected as being unpatentable over Takagi in view of Waldfried, Takagi fails to disclose the claimed plasma containing hydrogen, helium and argon, and Waldfried does not cure this deficiency in Takagi. Therefore, Claims 35-36 are in condition for allowance for at least the same reasons as amended Claim 22, from which they directly or indirectly depend. Further, amended Claim 42 recites a plasma containing hydrogen, helium and argon, and is thus also in condition for allowance. Accordingly, it is respectfully requested that the rejection of Claims 35-36 and amended Claim 42 under 35 U.S.C. § 103(a) be withdrawn.

Application No. 10/581,601
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For the reasons discussed above no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance for Claims 22-31 and 35-42 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in better form for allowance, the Examiner is encouraged to contact Applicants undersigned representative at the below listed telephone number.

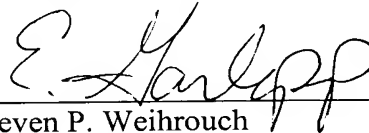
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